202401UECM3473OE4a

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Review of preview

Started on	Sunday, 7 April 2024, 11:44 AM
Completed on	Sunday, 7 April 2024, 11:44 AM
Time taken	14 secs
Marks	0/8
Grade	**0** out of a maximum of 10 (**0**%)

1

Marks: 1

- Suppose the losses X_1, X_2,..., X_n have $E(X_j) = 255$, $V(X_j) = 150$, and $Cor(X_i, X_j) = 0.68$ for $i \neq j$.
- You are given $X_1 = 280$, $X_2 = 270$, $X_3 = -135$.
- The credibility premium for the 5^{th} observation is 200 based on the first 4 observations.

Determine the credibility premium for the 6^{th} observation if $X_5 = 245$. _____

Answer:

✗

Make comment or override grade

Incorrect
Correct answer: 208.225806
Marks for this submission: 0/1.

2

Marks: 1

You are given the following:
(i) Two risks have the following severity distribution.

	Probability of	Claim Amount
Amount of Claim	Risk 1	Risk 2
190	0.23	0.83
4800	0.19	0.11
18900	0.58	0.06

(ii) Risk 2 is three times as likely as Risk 1 of being observed.
(iii) A claim of 190 is observed, but the observed risk is unknown.
Determine the Buhlmann estimate of the expected value of a second claim amount from the same risk. _____

Answer:

✗

Make comment or override grade

Incorrect

Correct answer: 2817.30452
Marks for this submission: 0/1.

3
Marks: 1

You are given the following:

- The conditional distribution $f_{X|\Theta}(x|\theta)$ is a member of the linear exponential family.
- The prior distribution $\pi(\theta)$ is a conjugate prior for $f_{X|\Theta}(x|\theta)$.
- $E(X) = 10.00$.
- $E(X_2|X_1 = 60) = 22.50$, where X_1 is the value of single observation.
- The expected value of the process variance is 150.00.

Determine the variance of the hypothetical means. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 50
Marks for this submission: 0/1.

4
Marks: 1

You are given:

- There are two groups of insureds, A and B. Each group is equally large.
- The number of claims for each member of either group follows a Poisson distribution.
- You are given the following information on mean number of claims for members of each group.

Group	Average Hypothetical Mean	Variance of Hypothetical Mean
A	0.5	0.04
B	1.0	0.25

Calculate the Buhlmann credibility to assign to one of a member. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 0.2167
Marks for this submission: 0/1.

5
Marks: 1

You sell individual health coverage. Aggregate claim costs vary for each insured, based on the insured's diet and exercise habits. The following table lists the mean and variance of annual aggregate claim costs per insured.

	Annual aggregate claim costs			
	Bad Diet		Good Diet	
Exercise Habit	Expected Claims	Claim Variance	Expected Claims	Claim Variance
Sedentary	10	20	6	16
Active	8	13	4	11
Total	9.0	17.5	5.0	14.5

80% of insureds have a bad diet and 20% have a good diet. Calculate the Buhlmann credibility factor for one year of experience. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 0.1829
Marks for this submission: 0/1.

6

Marks: 1

- Claims sizes for each insured have mean θ and variance a.
- μ varies by insured according to a gamma distribution with $\alpha = 4$, $\beta = 1270$.
- For one insured, 2 claim sizes of 1150 and 1840, plus a third unknown claim size, are observed.
- Using Buhlmann credibility with the known information, the expected claim size is 1940.
- The third claim size turns out to be 1410.

Using Buhlmann credibility methods and using all three claim sizes, determine the revised value of the expected claim size. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 1778.583899
Marks for this submission: 0/1.

7

Marks: 1

You are given:

- An insured's loss size follows a single-parameter Pareto distribution with parameters α = 5 and θ.
- The parameter θ varies by insured uniformly on [550,1040].
- An insured submits claims of 720, 955, 1290

Using Buhlmann credibility methods, estimate the expected size of the next claims. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 990.60841
Marks for this submission: 0/1.

8

Marks: 1

You are given the following:

- The number of claims follow a distribution with mean λ and variance $e^{0.085\lambda}$.
- Claim sizes follow a distribution with mean θ and variance $e^{0.14\theta}$.
- the number of claims and claim sizes are independent.
- Λ and Θ have a prior probability distribution with joint density function
$$f(\lambda, \theta) = A\,\lambda^5\,\theta^4 e^{-(0.1\lambda+0.2\theta)},\ \lambda, \theta > 0$$
where A is a constant.
- During the first year we observed 2 claims and the claim amounts are 490, and 290.
- During the second year we observed 3 claims and the claim amounts are 280, 300 and 270.

Determine the Buhlmann estimate of the expected aggregate loss for the third year. _____

Answer:

Make comment or override grade

Incorrect
Correct answer: 1481.78

Marks for this submission: 0/1.

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